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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,457	04/19/2004	Shinji Maekawa	0553-408	2984

7590 07/06/2007

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EXAMINER	
PADGETT, MARIANNE L	
ART UNIT	**PAPER NUMBER**
1762	

MAIL DATE	DELIVERY MODE
07/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/827,457	MAEKAWA ET AL.	
	Examiner	Art Unit	
	Marianne L. Padgett	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,16-18 and 23-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7, 16-18, 23-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 4/9/2007
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The amendments to the claims have corrected the 112, first & second problem is noted in sections 3 & 4 of the action mailed 11/7/2006, with the amendments to the specification supported by the original language in claims to & 5, aiding in the correction.

The amendments to the claims have also added new limitations concerning direction of the plasma to the substrate's selected portions via a nozzle, with the pattern forming liquid composition directed to same portions via what may be a different nozzle, noting as claim the two steps may be done in either order when only the infinity is be affected in claim 1 & new claim 23, however when a groove or hole is being created, that step still must become first. It is also noted that for the claims as now phrased, while the plasma must come from a nozzle and you radiate a selected portion, there is no requirement that the plasma is only need apply to the selected portions, only that the plasma must come the nozzle & after being treated with the plasma the portion has a "liquid affinity". None of the previously applied art employed nozzles to apply plasma, and the disclosures therein were directed to the plasma have the differential effects on surface in order to create claimed affinities, thus the amendment does differentiate from the previously applied prior art.

The supplied translation for JP 11-340129 by Seki et al., is analogous to the previously applied EP reference to Seki et al., thus involves similar issues.

2. Claim 6is objected to because of the following informalities: while understandable, the amended phrasing is non-idiomatic, since as phrased the plasma is the object being irradiated, which is obviously unintended, so more appropriate phrasing would be -- irradiation with the plasma... -- in line to of amended claim 6. Appropriate correction is required.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 3-4 & 6-7 are under 35 U.S.C. 103(a) as being unpatentable over Seki et al. (EP 0989778 A1, as discussed in the section 6 of the action mailed 11/7/2006, in view of Lewis et al. (5,272,979).

The claims have been amended to require the plasma that effects the affinity to come from a nozzle, while Seki et al. (EP) only discusses the plasma and its effects, not the shape of the plasma or the means of applying it, however it is old and well-known as illustrated by Lewis et al. (979) to employ plasma jet discharges in order to ablate or otherwise transformed surface layers to change the affinity to subsequently applied coating such as printing ink or aqueous solutions, where such plasma techniques discussed in Lewis et al. include the use of working gases such as N, Ar or another inert gas or oxidizing gases, such as oxygen; can be employed for effecting positive or negative affinity of substrates, including for wet coding techniques. In Lewis et al. (979 see the abstract; figures 3 & 4; col. 3, lines 46-55; col. 4, especially lines 1-12, & 40-61; col. 5, lines 25-41; col. 6, lines 55-col. 7, line 29; col. 9, lines 51-61; col. 10, lines 25-39; col. 14, lines 43- 54+; and col. 15, lines 33-68+). It would've been obvious to one of ordinary skill in the art that as Seki et al. is providing teachings concerning plasma is that selectively affect the surface affinity to subsequent coating, but do not discuss particular plasma details, to the two prior art plasma techniques that create like differential affinity treatments, where the process of Lewis et al. provide such techniques which would have been expected to be equivalently effective in the process of Seki et al., as Lewis et al. demonstrates their techniques effectiveness for multiple different coatings inclusive of polymeric materials, metal materials, silicones, inks, etc., thus showing the expected general of effectiveness of such affinity treatments via plasma from a nozzle.

To reiterate, Seki et al. (EP) teach a deposition process that employs differential affinity of a liquid for treated substrate surfaces that may be deposited via drops from an inkjet system. In the first and fourth embodiments, is taught deposited a bank material to form partitions, where that bank material may be insulating material such as polyimide, or a 2 level bank with the upper-level been an organic layer such

as polyimide & the lower layer being an inorganic insulator. The bank structure may be formed in an initial pattern deposition, or other conventional means such as depositing the insulating layer over the entire substrate, then patterning via etching with a mask to form the bank structure. In order to create adequate differentiation of affinity for the liquid to be deposited inside the enclosures surrounded by the banks, Seki et al. (EP) teach plasma treatment, that may be consecutive treatments of oxygen plasma, then fluorine-containing plasma, or a single plasma with an optimized mixture of oxygen & fluorine containing gases, where the plasma may be an atmospheric pressure plasma, or a reduced pressure plasma (i.e. may be within the claimed pressure ranges). In either case selected differentiation of affinity occurs, that may create a liquid-repellent thin film on the insulating material of the banks, such that the contact angle is $\geq 50°$, while the oxygen in the plasma creates an affinity in the surrounded area, such that the contact angle is $\leq 20°$. Note that in either case of one plasma treatment or consecutive plasma treatments there is selective formation of an affinity region via plasma, where the affinity region is with the repellent thin film region on the surface of the substrate, and it is noted that with the mixed gas treatment the selective creation of affinity for the [polar] liquid to be deposited if simultaneous with the creation of the liquid-repellent thin film that essentially creates a Teflon surface on the banks. Liquid droplets to be deposited via inkjet printing inside the hydrophilic or affinity treated enclosures is inclusive of organic semiconductor material for forming thin film light emitting elements. Particularly see the abstract; figures 1-2, 8-9, etc.; [0002]; [0019-0024]; [0028]; [0030-31]; [0033]; [0037]; [0041- 46, especially 42 & 45]; [0048]; [0050-54]; [0059-62]; [0065-66]; first embodiment in [0072- 89, especially 77-79, 81, 84-85]; [0116]; fourth embodiment in [0122-131, especially 124, 125 & 129]; etc. also note that besides the specific example for use in forming EL elements & with polar liquids to be deposited, Seki et al. (EP) generally teach the use this technique for creating patterned liquid affinity & repellent regions, where the surface modification technique (e.g. plasma) is optimized according to polarity (polar or nonpolar) of the material to be deposited ([0022-24], [0030-31], [0037], [0041-42], 0045] +).

5. Claims 2, 5 & 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al. (EP), in view of Lewis et al., as applied to claims 1, 3-4 & 6-7 above, and further in view of Di Dio (2004/0152329 A1).

It remains noted, including with the amendments of 4/9/2007 that for limitations in claim 2, the claim of "an affinity for liquid" is to an unspecified liquid with no necessary relationship to "a drop composition", that liquid could represent either a polar or a nonpolar liquid, while the drop composition may or may not contain any liquids, and if it does those liquids may be either polar or nonpolar. Therefore, the liquid referred to in independent claim 2 could be a nonpolar liquid (and as claimed need never be used for anything), whereas the drop composition may read on a polar composition, which would be a logical combination if one desires deposition in the grooves or holes, but to not deposit on the raised areas.

To reiterate discussion from section 7 of the action mailed 11/7/2006, while Seki et al. (EP) teach drop deposition of composition is having the opposite polarity from the banks/partition, into the area is surrounded by the raised banks/partition, and they teach that that partition may be formed by blanket deposition followed by etching, they do not teach that that etching is via plasma, but may use lithographic and masking techniques ([0079]; [0124]). Seki et al. also note in paragraph [0056], that it is also permissible to only do a fluorine-based plasma treatment.

Di Dio teach a process of depositing hydrophobic material, then depositing a "deep UV" photoresist material thereon, patterning the photoresist material to expose the hydrophobic layer in the pattern, followed by etching of the exposed hydrophobic material, where that etching may include plasma etching to expose underlying material. It would've been obvious to one of ordinary skill in the art to employ the patterning technique of Di Dio in forming the banks and partitions in Seki et al. (EP), when only fluorine-based plasma treatment of the material of the bank-forming layer is required, as it provides a lithographic and masking technique consistent with those suggested by the primary reference, and may

combined steps or apply the patterning technique to the fluorine plasma treated bank-forming layer, after the plasma treatment for those situations as taught were oxygen-containing plasma treatment is not required to give sufficient hydrophobicity to the area where inkjet deposition is required to be performed, i.e. in the area surrounded by the banks. While this combination does not teach the plasma for the etching comes from a nozzle, Lewis et al. (979) as discussed above clearly teaches ablation from a plasma, where patterning is inclusive of their technique, hence the suggested plasma etching of the combination would have been further obvious to accomplish the own a plasma from a nozzle, for reasons as discussed above & as it has been demonstrated to provide patterning as desired by the combination.

6. Claims 1-4, 6-7 & 14-16 are under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (6,228,435 B1), as discussed in the section 8 of the action mailed 11/7/2006, in view of Lewis et al. (5,272,979), discussed above in section 4.

Yoshikawa et al. teaches a parallelplate plasma apparatus, however as previously discussed desires to produce selective surface affinity effects, such that it would've been obvious to one of ordinary skill in the art to employ a plasma apparatus such as taught by Lewis et al. (979) which teaches the capability of direct writing type plasma treatment for affinity providing the advantageous capability of more precise patterning due to the selective nature of the direct write technique, thus motivating employed such an alternative with improved resolution or versatility in patterning is desired.

To reiterate, Yoshikawa et al. teach depositing a silane coupling agent via a plasma discharge process onto a base composed of a transparent glass sheet with a pattern of a thin metal film (light-shielding member) thereon, to deposit a water repellent thin film across the entire surface, including the insulating part of the surface. Thereafter, the coated substrate is treated to an oxygen plasma, which selectively exposes the dielectric substrate surface of the light transmitting material to make a less water repellent or hydrophilic pattern thereon, after which an inkjet system may be reproducibly employed to selectively deposit different colored inks in the hydrophilic section to make colored pixels. Particularly

see the abstract; col. 4, lines 45-68; col. 5, lines 4-17 & 26-51; examples 1-2, particularly col. 6, lines 13-17, 20-26, 34-45 & 53-67; and claims, especially 1-2, 5, 9-11, 13-18 & 33.

Yoshikawa et al. (435) does not discuss particular degrees of hydrophilicity or water repellence, i.e. contact angles, however requires the differentiation to be sufficient to reproducibly effect the separation of the later inkjet deposited colored filter material, hence it would've been obvious to one of ordinary skill in the art to ensure the materials and treatment as taught produce adequate contact angle differentiation, which would have been expected to be inclusive of the claimed ranges in order to provide the taught reproducible results. Yoshikawa et al. (435) does not discuss the pressure under which the drop discharge from the inkjet system is operated, however such systems are typically operated at atmospheric pressure (i.e. not under vacuum), hence it would've been obvious to one of ordinary skill in the art to perform the taught inkjet processing under such typical conditions as atmospheric pressure. The plasma processing discussed in Yoshikawa et al. (435) discusses 0.1 torr or lower for the oxygen plasma and in the example 1 employs a pressure of 0.1 Pa for the oxygen plasma and a pressure of 0.05 Pa for plasma deposition of the silane coupling agent, hence does not use pressures in the particular range claimed for these specific exemplary materials in a specific RF plasma generator, however as indicated on col. 5, lines 23-25, the process is not limited to a specific plasma vapor deposition process, but any such known process may be employed, hence it would've been obvious to one of ordinary skill in the art to optimize pressures for particular apparatus & deposition materials, such that any range of pressures affected for producing such deposition plasmas and oxygen plasmas would have been expected to be effective for the process, as the particular pressure employed is not critical, noting plasma apparatus that operate at atmospheric pressure & reduce pressure are old and well-known & the claimed range is inclusive of known plasma parameters employed with no specific materials and no specific apparatus.

7. References to Klein et al. (5134428) & Lewis et al. (WO 92/05957) provide equivalent teachings to those found in Lewis et al. (979).

8. Claim 1-7, 16-18 & 23-30 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 7226819 B2 (Maekawa et al.) in view of Lewis et al. (979). The patent claims are directed to processes with overlapping limitations, including for making like products with conductive layers and using plasma process to treat the surface to create particular liquid affinities, but differ by not requiring use of nozzles to apply the plasma, however as discussed above Lewis et al. (979) shows the general applicability & expected effectiveness of such techniques, such that it would've been obvious to one of ordinary skill in the art that given selective affinity treatments to employ plasma techniques such as taught by Lewis et al. for the benefits in selectivity and precision derived therefrom.

9. Claims 1-6, 16-18 & 23-30 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-35, or 1-22, 28-37 & 44-47 of copending Application No. 10/575492, or 11/025192, respectively in view of a view of Lewis et al. (979). This application claims are directed to processes with overlapping limitations, including for making like products with conductive layers and treated to create selective regions of differentiated affinity to preceding liquid compositions to be dropped thereon, where (492) is using plasma process to treat the surface to create particular liquid affinities, but differ by not requiring use of nozzles to apply the plasma, , & application (192) is generic, however as discussed above Lewis et al. (979) shows the general applicability & expected effectiveness of such techniques, such that it would've been obvious to one of ordinary skill in the art that given selective affinity treatments to employ plasma techniques such as taught by Lewis et al. for the benefits in selectivity and precision derived therefrom. Note it with the equally applicable to the generic technique, as a means for creating the affinity would be required.

This is a provisional obviousness-type double patenting rejection.

10. Further art of interest includes Kim et al. (7102722 B2) & Seki (6911773 B2), with further teachings involving selective affinity caused by plasma techniques with drop applied subsequent

coatings, noting that Kim et al. uses masks to pattern the plasma, thus selectively applying it, but not via a nozzle.

Previously noted art interest include Seki et al. (6784459 B2; col. 6, lines 1-31); David et al. (6878419 B2); Kubacki (6764812 B1); & Okada et al. (2002/0014470 A1; [0133-136]), who provide further teachings inclusive of selective plasma treatment to affect the hydrophilicity, or liquid repelling nature of substrate surfaces. The application publication to Toyoda et al. (2006/0169672 A1) has relevant teachings, but is not prior art.

11. Applicant's arguments with respect to claims 1-7, 16-18 & 23-30 have been considered but are moot in view of the new ground(s) of rejection.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 8:30 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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6/25/2007